Guidelines for Scientific Strategic Planning White Paper

Introduction to Scientific Theme

- For your working group, provide an overview of the research community that will utilize this suite of instruments. For each research community, list the scientific challenges that drive the need for a high brightness synchrotron facility as well as their potential impact.
- What is the potential size of the user community and the opportunities to grow industrial involvement.

The Growth, Expansion, and Transition of NSLS Scientific Programs

- Describe how on-going NSLS scientific programs covered by your working group can be strengthened and transitioned to the NSLS-II facility and identify new research opportunities that should be developed in preparation for the new facility. The description should include:
 - a. Technical developments in detectors, control and/or analysis software, sample environments and handling, research infrastructure, etc. that are needed to enhance existing programs as well as to enable new research opportunities.
 - b. New beamlines that, if constructed at the NSLS, would open new research opportunities to develop programs or techniques that will be important at NSLS-II.
 - c. The identification of potential new user groups within the science community emphasizing any special requirements for these new user groups to effectively use synchrotron facilities.

Proposed Suite of Beamlines

- For your working group, provide an overview of the proposed suite
 of beamlines that will be required to meet the scientific challenges
 confronting the Earth and environmental science community. This
 should include transitioned NSLS beamlines (existing and/or
 proposed) and new NSLS-II beamlines. These beamlines should be
 divided into:
 - a. Primary Beamlines with beamline components or endstation instrumentation highly optimized for a particular research community and in high-demand by that community as a primary research technique.
 - b. Secondary Beamlines that are optimized for a specific technique and can be shared by different scientific communities. Measurements done on secondary beamlines typically complement the measurements done on the primary beamlines. For each secondary beamline, estimate the percent usage by your scientific community and list other scientific communities that are also potential beamline users.

Recommendations for BAT's

 Provide recommendations for BAT membership. Ultimately we will need a summary of team members and their expertise. Brief description of what each member brings to the team.

Beamline Specifications and R&D Needs

- For a new and transitioned beamlines, list the characteristics that will make the beamline world-leading including:
 - a. NSLS-II source (e.g. undulator, 3-pole wiggler, damping wiggler, bending magnet) required to achieve beam flux, brightness, energy-range, polarization, etc.
 - b. Beamline optics required to achieve beam focus, energy-resolution, etc.
 - c. Endstation instrumentation that will contribute to making the facility world-leading.
 - d. Special requirements such as vibration isolation or toxic gas/nanoparticle handling.
 - e. Research and development efforts that will be required to meet challenging technical specifications.
 - f. If the beamline is transitioned from an existing NSLS beamline, include recommendations for upgrades to make the beamline suitable for a third generation synchrotron facility as well as the associated timeline for implementing the improvements.

Recommended Transition/Construction Sequence

 Provide recommendations for the phased construction of the new NSLS-II beamlines and the decommissioning and transitioning of new or existing NSLS beamlines. Your recommendations should give priority to beamlines that support research projects enabled by the high-brightness of the NSLS-II synchrotron and should utilize upgraded and transitioned NSLS beamlines to minimize the disruption of on-going scientific research in the field.

Facility Infrastructure at NSLS-II

 What are the anticipated needs of the Earth/Enviro research community for office space, wet and dry lab facilities, largescale computing facilities, and other extraordinary requirements such as for actinides, biohazards, toxic gases, etc? What user "quality-of-life" amenities would you recommend?

Staffing Requirements

- What are the staffing requirements for these end-stations?
- Not just the number of people supporting each end-station but what type of expertise have we as a community seen to be optimal in supporting research efforts.